PUBLIC TELEPHONE MANAGEMENT

This invention concerns a telephony system with a number of public telephones connected to a set of information servers via a communication network.

This invention is applied especially advantageously to all telephony systems comprising public telephones, whether they are with a public or private operator.

Telephony systems are now known in which the whole of public telephones, also named "payphones", is connected with a communication network comprising the switched telephone network (STN) with which they communicate using a modem and according to a specific protocol, named owner protocol. A supervision server is also connected via a modem with the switched telephone network, this server often called PMS in relation with the English expression "Payphone Management System", fitted with the same owner protocol as the payphones. This supervision server's function is to exchange with the payphones population information concerning the telephony system operation.

As an example, a payphone may call the supervision server via the switched telephone network at a given time or if there is an alarm, in order to send information relative to the use of this payphone, such as the number of calls made, the number of units involved, etc. All this data is then consolidated by the supervision server so as to prepare various statistics. Inversely, the supervision server may supply information to the payphones, such as new tables of rates or parameters when they are modified.

However, these known telephony systems have a number of drawbacks. In particular, the architecture used is centred around a supervision server that is a PC computer where the central unit power is often too small to manage a large network of payphones, the more so as it also has to directly manage modem cards with its bus. Furthermore, the use of an owner protocol is on the one hand, difficult, as it is necessary to often

change it at each system modification, and on the other hand limited as it only allows exchanging information with servers equipped with the same specific protocol.

Thus, the technical problem to be solved with this invention is to propose a telephony system including a number of payphones connected to a set of information servers via a communication network, that, on the one hand, has a decentralised, open and evolving architecture, enabling an exchange of information extending to large number of servers, in particular service providers, detached from the communication network.

The solution of the technical problem consists, according to this invention, in that at least one of the information servers is connected to Internet, and in that each payphone is equipped with Internet communication protocols complying with the IETF technical guidelines.

Thus, the users of the telephony system as per this invention may access a large number of information servers over the Internet network, with their choice only depending on the system operator. Furthermore, the operator may, at any time and very simply, add new servers available to users, thanks to the flexibility and the evolving and open character of the invention telephony system resulting from its attachment to Internet. It is sufficient for this to allocate an Internet address to each new server.

Another advantage of this invention is in the fact that it allows a dispersion of the supervision means into one supervision server itself, responsible for managing the information exchange with payphones and to make up statistics, and a software and/or files server. Of course, each of these servers will have received its own Internet address. In this way, the supervision server is free of all transfer operations for software and files, which makes it more available for its other tasks.

According to a first embodiment, the telephony system relating to this invention comprises a remote access server able to put into communication all the payphones with the whole of the information servers, by routing information via Internet addresses through the said communication

network. In such case, all the connections to payphones via modems are diverted to the remote access server, which relieves as much the supervision server. As an example, the said communication network is an analogue or digital switched telephone network.

According to a second embodiment, the said communication network is Internet, the said payphones being also connected to Internet.

The following description facing the attached drawing, given as a non-limiting example, will explain clearly what the invention is and how it may be embodied.

Figure 1 is a diagram of a first telephony system in accordance with the invention.

Figure 2 is a diagram of a second telephony system in accordance with the invention.

On figure 1 is shown a telephony system including several payphones 10, 10', 10", ... connected to a set 32 of information servers via a communication network that, in the example of figure 1 embodiment, is an analogue or digital switched telephone network (STN 1).

As can be seen on figure 1, the set 32 of information servers is connected to Internet 2, whereas the payphones 10, 10', 10",... are equipped with communication protocols TCP/IP complying with the IETF (Engineering Task Force) technical guidelines.

In the embodiment shown on figure 1, a remote access server is placed between the communication network 1 and the set 32 of servers and is responsible for putting into communication the payphones 10, 10', 10",... with the information servers 331, 332, 341, 342, 343 by routing the information via Internet addresses allocated to the said servers. The physical layer of the payphones is achieved here using analogue or digital modems (ISDN). Practically, the server 20 may be made of a router of the 3620-CH type manufactured by the Cisco company.

It must be noted here that, whether in the figure 1 example the communication network shown is an analogue or digital switched telephone

network, the telephony system in this invention could also be embodied, as per figure 2, with Internet as a communication network, the payphones 10, 10', 10",... being also connected to Internet via an Internet service provider ISP.

In figure 1, it is possible to see the existence of a communication interface 31 situated between the remote access server 20 and the set 32 of information servers. This interface 31 is responsible for monitoring, synchronising and regulating the information exchange sessions between payphones 10, 10', 10"... and the servers 331, 332, 341, 342, 343. One of the functions of the said communication interface 31 is to set information exchange sessions that are reliable and authenticated consisting for example in identifying in a definite manner the payphones during an information exchange with the servers, or also to code data in order to secure the communication if necessary.

Another function of the communication interface 31 is to pilot and regulate the information exchanges made by transferring standard files and files complying with the Internet protocols. During such transfers, the interface 31 must in particular detect any virus that may infect the files.

Practically, the communication interface 31 may be made of a PC type computer operating with Windows NT (registered trademark). Any request for connecting to a server 331, 332, 341, 342, 343 reaches the input port 311 that is continuously listened to by interface 31, then redirected towards a working port 312. The request is then analysed using a software application in the Java language (registered trademark) enabling the monitoring and setting of a session as meant in the protocol. A standard interface (socket) is then opened and the request is sent to the intended server, and vice-versa.

As can be seen in figures 1 and 2, the whole 32 of information servers is made into a local network 30, Ethernet for instance. In the case of figure 1, the communication interface 31 is part of the local network 30. This architecture in a local network facilitates the servers' maintenance and supervision.

In figure 1, there has been a separation in the server assembly 32, of a first assembly 33 of management servers for payphones 10, 10', 10",... and a second assembly 34 of service provider servers.

As has been already described above, the main function of the assembly 33 of management servers is to exchange with payphones 10, 10', 10",...information on their operation and more generally the operation of the global telephony system. As an advantage and contrary to the systems presently known, the assembly 33 of management servers includes a supervision server 331 (PMS) and a software programme and/or files server 332 (FTP = File Transfer Protocol). The supervision server 331 is responsible for organising information exchanges between payphones 10, 10', 10",... and the management assembly 33, especially for monitoring file and/or software programme transfers, in particular the downloads, between payphones and the FTP 332 server. Furthermore the PMS 331 server manages the payphones initialising sessions and establishes statistical data from information received from payphones 10, 10', 10",...

The FTP 332 server is intended either to provide payphones with the files necessary for their operation, such as tables of rates, configuration parameters, for instance regarding the numbering system, opposition or monitoring lists, status files for payphones, or to receive from payphones information regarding their use, i.e. report on transactions, a daily report including in particular data concerning traffic, a report on alarms that allows warning the whole management 33 of some events that may have occurred on payphones, such as a breakdown in the card reader or a handset torn-up, so as to organise the service of a monitoring agent.

It is seen in figure 1 that the FTP 332 server is not connected to interface 31. This is because, due to this server's speciality, this connection is not necessary, but this server remains however under the monitoring of the supervision server 331.

A management session may run as follows. At a predetermined time or in case of an alarm, a payphone calls the remote access server 20 to reach

the server PMS 331. The server 20 then allocates dynamically to the payphones a temporary Internet address so as to enable the exchange of information between the server PMS 331 and the payphone. The server PMS 331 may then ask the payphone its present status and ask it, for instance, to connect with the server FTP 332 in order to download a new table of rates if it occurred that the previous table in the payphone was not up-to-date. At the end of the communication, the payphone is set back to the waiting status.

It should be noted here that communication interface 31, the server PMS 331 and the server FTP 332, instead of being separate items as in figure 1, may be regrouped into a single computer, for instance of the PC type. This will be so, in particular, for small-size-network operators.

The second assembly 34 of servers includes servers 341, 342 providing on-line services on Internet, such as e-mail (EM) or E-commerce (EB). These services may also be the content of Web pages for which the hyperlinks are related to the function keys on payphones 10, 10', 10",...

Other services may be services self-managed on the local network, such as publicity (ADV), horoscope, weather forecasts, municipal services, etc.